

AMENDMENTS TO THE CLAIMS

In the Claims:

1. (Currently amended) A recombinant *E. coli* host cell comprising one or more expression vectors, said expression vectors comprising alone or in combination:
 - (a) methylmalonyl CoA mutase genes *mutA* and *mutB* from either *Propionibacterium shermanii* (~~SEQ ID No. 1 and 2~~) or *Streptomyces cinnamonensis* (~~SEQ ID No. 3 and 4~~), and
 - (b) a *Propionibacterium shermanii* epimerase gene having the nucleotide sequence given in ~~SEQ ID NO:5~~ ~~SEQ ID NO:1~~, and
 - at least one modular polyketide synthase (PKS) gene,
wherein the products of proteins encoded by said methylmalonyl CoA mutase and epimerase genes are effective to produce S-methylmalonyl CoA required for biosynthesis of a polyketide produced by a modular polyketide synthase (PKS) produced by at least one the PKS gene in said host cell,
said PKS gene being contained in a vector that replicates extrachromosomally or is integrated into chromosomal DNA of such host cell,
wherein said host cell, in the absence of said expression vectors, is unable to make said polyketide.

2. (Canceled) A recombinant host cell comprising one or more expression vectors that drive expression of enzymes capable of making a product and a precursor required for biosynthesis of the product in said host cell, wherein said host cell, in the absence of said expression vectors for said enzymes capable of making said precursor, makes said product in substantially lesser amounts due to said precursor being present in said host in limiting amounts.

3. (Canceled) The host cell of Claim 1 or 2, wherein said precursor is a primary metabolite that is produced in a first cell but not in a second heterologous cell.

4. (Canceled) The host cell of any of Claims 1 or 2, wherein said product is a polyketide.
5. (canceled) The host cell of Claim 4, wherein said polyketide is a polyketide synthesized by either a modular, iterative, or fungal PKS.
6. (canceled) The host cell of Claim 5, wherein said precursor is selected from the group consisting of malonyl CoA, propionyl CoA, methylmalonyl CoA, ethylmalonyl CoA, and hydroxymalonyl CoA.
7. (canceled) The host cell of Claim 6, wherein said precursor is methylmalonyl CoA.
8. (canceled) The host cell of Claim 7 that is either a prokaryotic or eukaryotic host cell.
9. (canceled) The host cell of Claim 8 that is an *E. coli* host cell.
10. (canceled) The host cell of Claim 8 that is a yeast host cell.
11. (canceled) The host cell of Claim 8 that is a plant host cell.
12. (canceled) The host cell of Claim 9, wherein said polyketide is synthesized by a modular PKS.
13. (canceled) The host cell of Claim 12, wherein said precursor biosynthetic enzyme is a methylmalonyl CoA mutase that converts succinyl CoA to methylmalonyl CoA.

14. (canceled) The host cell of Claim 13, wherein said methylmalonyl CoA mutase is derived from propionibacteria.
15. (canceled) The host cell of Claim 14, which has been further modified to overexpress a B12 transporter gene.
16. (canceled) The host cell of Claim 15, wherein said B12 transporter gene is endogenous to *E. coli*.
17. (Previously amended) The host cell of Claim 1 in media that contains hydroxocobalamin.
18. (canceled) The host cell of Claim 13 that further comprises an epimerase that converts R-methylmalonyl CoA to S-methylmalonyl CoA.
19. (canceled) The host cell of Claim 18, wherein said epimerase is derived from propionibacteria.
20. (canceled) The host cell of Claim 18, wherein said epimerase is derived from *Streptomyces*.
21. (canceled) The host cell of Claim 12, wherein said precursor biosynthetic enzyme is a propionyl CoA carboxylase that converts propionyl CoA to methylmalonyl CoA.
22. (canceled) The host cell of Claim 21 that has been further modified to overexpress a biotin transferase enzyme.
23. (canceled) The host cell of Claim 22, wherein said biotin transferase enzyme is encoded by the *birA* gene.

24. (Canceled) An *E. coli* host cell that expresses methylmalonyl CoA mutase genes mutA and mutB from either *Propionibacterium shermanii* (~~SEQ ID NOS: 1 and 2~~) or *Streptomyces cinnamonensis* (~~SEQ ID NOS: 3 and 4~~), and a *Propionibacterium shermanii* epimerase gene having the nucleotide sequence given in ~~SEQ ID No. 5~~ SEQ ID No. 1, and said host cell further expresses a modular polyketide synthase (PKS) gene or genes, said PKS gene or genes contained in a vector that replicates extrachromosomally or is integrated into chromosomal DNA.
25. (canceled) A yeast host cell that expresses heterologous methylmalonyl CoA mutase and epimerase genes.
26. (Previously added) The host cell of Claim 1 that comprises two expression vectors, one of which is integrated into chromosomal DNA of said cell.
27. (Previously added) The host cell of Claim 1 that comprises two expression vectors, one of which is a plasmid.
28. (Currently amended) The host cell of Claim 1, wherein said methylmalonyl CoA mutase genes are the *Propionibacterium shermanii* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 1 and 2~~).
29. (Currently amended) The host cell of Claim 1, wherein said methylmalonyl CoA mutase genes are the *Streptomyces cinnamonensis* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 3 and 4~~).
30. (Previously amended) The host cell of Claim 1, wherein one or more of said genes is under control of a promoter from an *E. coli* gene.

31. (Previously amended) The host cell of Claim 1, wherein said PKS is 6-deoxyerythronolide B synthase.
32. (Currently amended) The host cell of Claim 17, wherein said methylmalonyl CoA mutase genes are the *Propionibacterium shermanii* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 1 and 2~~).
33. (Currently amended) The host cell of Claim 17, wherein said methylmalonyl CoA mutase genes are the *Streptomyces cinnamonensis* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 3 and 4~~).
34. (Currently amended) The host cell of Claim 17, wherein one or more of said genes is under control of a promoter from an *E. coli* gene [or a gene].
35. (Previously amended) The host cell of Claim 17, wherein said PKS is 6-deoxyerythronolide B synthase.
36. (Currently amended) The host cell of Claim 24, wherein said methylmalonyl CoA mutase genes are the *Propionibacterium shermanii* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 1 and 2~~).
37. (Currently amended) The host cell of Claim 24, wherein said methylmalonyl CoA mutase genes are the *Streptomyces cinnamonensis* methylmalonyl CoA mutase genes mutA and mutB (~~SEQ ID NOS: 3 and 4~~).
38. (Previously amended) The host cell of Claim 24, wherein one or more of said genes is under control of a promoter from an *E. coli* gene.

39. (Previously added) The host cell of Claim 24, wherein said PKS is 6-deoxyerythronolide B synthase.

40. (canceled) A method for producing a polyketide, which method comprises culturing the host cell of Claim 38 under conditions such that said PKS gene is expressed to produce a functional PKS, said S-methylmalonyl CoA is produced, and said functional PKS synthesizes a polyketide that incorporates said S-methylmalonyl CoA.